Author Index to Volume 54

References with (A) are to abstracts of papers presented at meetings of the American Physical Society. References with (L) are to Letters to the Editor; with (T) are to title only.

Adams, Norman I., Jr. (see Kovarik, Alois F.)—413

Ahearn, Arthur J. and Joseph A. Becker. Electron microscope studies of thoriated tungsten—448

Albertson, Walter. Spectrum of neutral iridium, Ir I—183

Alfvén, Hannes. On the sidereal time variation of the cosmic radiation—97

Alleman, R. S. and J. C. Hubbard. Ultrasonic reflection losses in air, helium and CO_2—313(A)

Allison, Samuel K., Lester S. Skaggs and Nicholas M. Smith, Jr. Precise measurement of the energy change in the transmutation of beryllium into lithium by proton bombardment—171

Alvarez, Luis W. Capture of orbital electrons by nuclei—486

——— Collimated, variable energy beam of pure thermal neutrons—235(A)

——— Production of collimated beams of monochromatic neutrons in the temperature range 300–10°K—609

Anderson, Carl D. (see Neddermeyer, Seth H.)—88(L)

Anderson, Paul A. Contact difference of potential between barium and magnesium—753

Andrews, C. Luther. Absorption of x-rays of wave-length $1.5 \leq \lambda \leq 8.3$A—994

Archibald, William J. Process of diffusion in a centrifugal field of force. II—371

Avrami, Melvin. Direct determination of crystal structure from x-ray data—300; Acknowledgment—1114(L)

Bacher, R. F. (see Crittenden, E. C., Jr.)—862(L)

——— (see Hoffman, J. G.)—644

——— (see Tomboulian, D. H.)—446

Bachmann, J. H. (see Glockler, George)—970(L)

Bacon, R. H., E. N. Grisewood and C. W. van der Merwe. β-ray spectrum of I^{128}—315(A)

Bailey, H. H. (see Bollman, V. L.)—792

Ballard, Stanley S. Constitution of the solfataric gases at Kilauea volcano, Hawaii—236(A)

——— Spectrochemical analysis of fertilizers, particularly for the micrometabolic elements—312(A)

Bardeen, John and Eugene Feenberg. Symmetry effects in the spacing of nuclear energy levels—809

Barieau, R. E. (see Giauque, W. F.)—147(L)

Batdorf, Samuel B. and Erich W. Beth. Radiative losses by particles of anomalous magnetic moment—237(A)

Bath, Jean (see Ellis, Joseph W.)—236(A)

Bearden, J. A. Determination of e/m from the refraction of x-rays in a diamond prism—698

——— (see Obert, Leonard)—1000

Becker, Joseph A. (see Ahearn, Arthur J.)—448

Beckman, J. W. and Leonard B. Loeb. Sign preference in cloud condensation on gaseous ions—862(L)

Bender, David. Refractive index of air in the visible and photographic infra-red—179

Bernet, E. J., R. G. Herb and D. B. Parkinson. Gamma-rays from fluorine due to proton bombardment—398

Beth, Erich W. (see Batdorf, Samuel B.)—237(A)

Beth, Richard A. Test for the adequacy of theory in the light of experiment—865(A)

Bethe, H. A. Coulomb energy of light nuclei—436

——— Method for treating large perturbations—955

——— (see Konopinski, E. J.)—130

——— **and C. L. Critchfield.** Formation of deuterons by proton combination—248, 862(L)

Beyer, Harold G. (see Whitaker, Martin D.)—771(L)

Binder, John L. Continuous absorption spectrum of iodine monochloride in the ultraviolet—114

Birge, Raymond T. Present status of the value of e/m—972(L)

Bitter, F. Generalization of the theory of ferromagnetism—79

Blackett, P. M. S. On the instability of the barytron and the temperature effect of cosmic rays—973(L)

Bleakney, Walker (see Sherr, Rubby)—388(L)

Bloomenthal, Sidney. Vibrational analysis for a new CuCl band system excited by active nitrogen—497

Bohn, J. Lloyd and Joseph Morgan. Experiments and theory on the performance of the Geiger point counter—314(A)

Bollman, V. L. and Jesse W. M. DuMond. Evidence for surface layers in cleaved calcite crystals—238(A)

——— **and J. W. M. DuMond.** Further tests of the validity of x-ray crystal methods of determining e—1005

———, **H. H. Bailey and J. W. M. DuMond.** Exploratory study of plural x-ray reflection methods applied to the problem of the diffraction pattern of calcite—792

Bonner, T. W. (see Hudspeth, Emmett)—308(L)

Bracewell, Kent H. Effective cross section of positive alkali ions with respect to gas molecules—639

Bradbury, N. E. and H. J. Meuron. Diurnal variation of atmospheric condensation nuclei—242(A)

Bramley, Arthur. Dirac equation with spin greater than $\frac{1}{2}$—314(A)

Breit, G. (see Hoisington, L. E.)—627

——— **and J. K. Knipp.** Note on K-electron capture in Be^7—652

Brickwedde, F. G., John R. Dunning, Harold J. Hoge and John H. Manley. Neutron scattering cross sections of para- and orthohydrogen, and of N_2, O_2, and H_2O—266

Brillouin, Léon. Thermal dependence of elasticity in solids—916

Brode, Robert B. and Dale R. Corson. Probable ionization of high speed electrons in nitrogen—238(A)

Brown, William Fuller, Jr. Domain theory of ferromagnetics under stress. Part III. Reversible susceptibility—279

Broxon, James W. and George T. Merideth. Analysis of high gradient, high pressure, gamma-ray, air ion current measurements, by Zanstra's adaptation of Jaffé's columnar theory—9
——— **and George T. Merideth.** Application of Clay's new value of the Jaffé-Zanstra coefficient for air to high pressure ion current measurements—605
——— **and George T. Merideth.** Measurements of gamma-ray ionization currents in air at high pressures and high gradients—1
Brož, J. (see Němejcová, A.)—379
Brubaker, Gordon. Scattering of alpha-particles by argon, oxygen, and neon—1011
Bruce, W. A. (see Jauncey, G. E. M.)—163
Buck, John H. Proton induced radioactivities. III. Zinc and selenium targets—1025

Callihan, D. (see Waldman, B.)—543(L), 1017
Carr, Emma P. and Hildegard Stücklen. Ultraviolet absorption spectra of simple hydrocarbons—865(A)
Carroll, Henry and J. R. Dunning. Interaction of slow neutrons with gases—541(L)
Carroll, Kenneth G. (see Margenau, Henry)—705
Cartmel, W. B. Exact solution of Lorentz' pair of triangles—867(A)
——— Michelson-Morley-Miller experiment—315(A)
Cashman, R. J. Comments concerning Anderson's paper on contact difference in potential between barium and magnesium—971(L)
Chapman, Seville. Carrier mobility spectra of liquids electrified by bubbling—520
——— Interpretation of carrier mobility spectra of liquids electrified by bubbling and spraying—528
Ch'en, Shang-Yi (see Ny, Tsi-Zé)—1045
Cobine, J. D., R. B. Power and L. P. Winsor. Electric arc reignition at high pressures—312(A)
Cohn, Willi M. Motion picture polarigraph for sky light investigations—241(A)
Collins, George B. and Victor G. Reiling. Čerenkov radiation—499
Condon, E. U. Note on the external photoelectric effect of semiconductors—1089
——— Simple derivation of the Maxwell-Boltzmann law—937
Coolidge, Albert Sprague, Hubert M. James and E. L. Vernon. On the determination of molecular potential curves from spectroscopic data—726
Cornell, S. D. Ultraviolet band spectra of HgCl, CdCl, and ZnCl—341
Corson, Dale R. (see Brode, Robert B.)—238(A)
Crane, H. R. and J. Halpern. Reply to the above note by L. Wertenstein—306(L)
Crawford, D. P. (see Wilkins, T. R.)—316(A)
Crawford, M. F. (see Stevenson, A. F.)—314(A), 375
———, **A. B. McLay and A. M. Crooker.** Spectrum of doubly ionized lead, Pb III—313(A)
Critchfield, C. L. (see Bethe, H. A.)—248, 862(L)
Crittenden, E. C., Jr. and R. F. Bacher. Nuclear isomerism in rhodium—862(L)
Crooker, A. M. (see Crawford, M. F.)—313(A)
Crudup, Josiah. Absorption of the shower-producing component of cosmic radiation in iron and lead—483

Dancoff, S. M. and P. Morrison. Note on internal conversion of arbitrary multipole order—149(L)
Davidson, W. L., Jr. and Ernest Pollard. Transmutation of titanium by Th C′ alpha-particles—408
Davisson, C. J. Theory of the transverse Doppler effect—90(L)
Delfosse, J. and John A. Hipple, Jr. Dissociation of $C_2H_2D_2$ by electron impact—1060
Delsasso, L. A. (see White, M. G.)—314(A)
Dember, A. (see Gould, W. O.)—240(A)
———, **A. Goetz and W. O. Gould.** Objective quantitative definition of the graininess of photographic emulsions—240(A)
Dempster, A. J. (see Wilkins, T. R.)—315(A)
Dieke, G. H. Bands of H_2 ending on the $2p^1$ II level—439
Dow, R. B. Viscosity characteristics of lubricating oils at high pressure at various temperatures—312(A)
——— (see Morgan, H. E.)—312(A)
Drill, H. T. Search for an electrostatic analog to the red shift—240(A)
Duffendack, O. S. (see Lifschutz, Harold)—714
Duffin, R. J. On the characteristic matrices of covariant systems—1114(L)
DuMond, Jesse W. M. (see Bollman, V. L.)—238(A), 792, 1005
——— (see Hirsh, F. R., Jr.)—789
——— (see Kirkpatrick, H. A.)—802
Dunning, John R. (see Brickwedde, F. G.)—266
——— (see Carroll, Henry)—541(L)
——— (see Whitaker, Martin D.)—771(L)

Eckart, Carl. Electrodynamics of material media—920
Ehrenkranz, Florence. Spark breakdown potentials in A, N_2 and H_2 for Pt and Na cathodes—239(A)
Ellett, A. and R. D. Huntoon. Asymmetric distribution of protons from deuteron-deuteron reaction—87(L)
Ellickson, Raymond. Method of calculating fluctuations—572
Ellis, Cecil B. and Harvey Hall. Crystal fields in rare earth ethylsulphates—478(L)
Ellis, Joseph W. and Jean Bath. Alterations in the near infra-red absorption spectra of water and of protein molecules when water is bound to gelatin—236(A)
——— **and E. L. Kinsey.** Vibrational-rotational radiation transitions in water molecules in nonpolar solvents—599
Elmore, W. C. Ferromagnetic colloid for studying magnetic structures—309(L)
——— Magnetization of ferromagnetic colloids—1092
Elsasser, Walter M. Mean absorption and equivalent absorption coefficient of a band spectrum—126
Evans, Robley D. (see Goodman, Clark)—866(A)
——— **and Clark Goodman.** Radioactive air inhalation as a health hazard—866(A)
Ewald, P. P. Force of excitation in the theory of dispersion—893

Farnsworth, H. E. (see Turnbull, John C.)—509
Feenberg, Eugene (see Bardeen, John)—809
——— (see Motz, Lloyd)—1055
Fett, G. H. Ignition potential in a low pressure neon tube—389(L)
Findlay, J. C., A. Pitt, H. Grayson Smith and J. O. Wilhelm. Velocity of sound in liquid helium—506
Fine, Paul. Normal modes of vibration of a body-centered cubic lattice—239(A)
Fleming, G. and J. E. Henderson. Search for temperature changes accompanying field emission at high temperatures—241(A)
Forbush, S. E. On world-wide changes in cosmic-ray intensity—975
Fowler, W. A. Scattering of fast electrons—773(L)
——— **and Jacquenette Oppenheimer.** Scattering and loss of energy of fast electrons and positrons in lead—320
Fox, Francis E. and George D. Rock. Ultrasonic radiation field of a quartz disk radiating into liquid media—223
Frenkel, J. On pre-breakdown phenomena in insulators and electronic semi-conductors—647(L)
Fricke, E. (see Knudsen, V. O.)—238(A)
Fried, B. (see Green, J. B.)—876
——— (see Shortley, George H.)—739, 749
Froehlich, H. Solution of the Schrödinger equation by a perturbation of the boundary conditions—945
Froman, Darol K. and J. C. Stearns. Altitude variation of the relative frequency of occurrence of pairs and larger cosmic-ray showers—315(A)
——— **and J. C. Stearns.** Evidence of neutrons in heavy particle showers—969(L)
Fuller, M. L. Atomic vibrations of a zinc-copper alloy—388(L)
Furry, W. H. Note on the theory of the neutral particle—56

Gamow, G. Tentative theory of novae—480(L)
Giauque, W. F., J. W. Stout and R. E. Barieau. Viscosity of liquid helium II—147(L)
Gilliland, T. R. (see Kirby, S. S.)—234(L)
Glockler, George and J. H. Bachmann. Raman effect of dibromofluoromethane—970(L)
Goetz, A. (see Dember, A.)—240(A)
——— (see Gould, W. O.)—240(A)
——— **and S. Scott Goetz.** Vitrification and crystallization of living cells at low temperature—236(A)
Goetz, S. Scott (see Goetz, Alexander)—236(A)
Goodman, Clark (see Evans, Robley D.)—866(A)
——— **and Robley D. Evans.** Determination of the radon and thoron content of air—866(A)
Goranson, Roy W. and W. A. Zisman. On the electrical properties of multilayers—544(L)
Gould, W. O. (see Dember, A.)—240(A)
———, **A. Goetz and A. Dember.** Instrument for the objective and quantitative determination of photographic graininess—240(A)
Grahame, D. C. Search for long or short-lived radiochlorine—972(L)
——— **and G. T. Seaborg.** Separation of radioactive substances without use of a carrier—240(A)
Granath, L. P. (see Williams, D. T.)—338
Green, J. B. and B. Fried. Zeeman effect in the spectrum of argon—876
——— **and J. A. Peoples, Jr.** Zeeman effect in the spectrum of neon—602
Grisewood, E. N. (see Bacon, R. H.)—315(A)

Hafstad, L. R. (see Rumbaugh, L. H.)—657
——— **and E. Teller.** Alpha-particle model of the nucleus—681
Hale, Donald H. First and second Townsend ionization coefficients for pure H_2—241(A)
Hall, Harvey (see Ellis, Cecil B.)—478(L)
Halpern, J. (see Crane, H. R.)—306(L)
Hardy, T. C. and S. L. Quimby. Change of thermal energy with adiabatic change of magnetization in iron, nickel and carbon steel—217
Harrison, George R. (see Weeks, Dorothy W.)—312(A)
Hartig, Henry E. and Arthur W. Mellon. Transmission of damped electromagnetic waves through small hollow metal tubes—646(L)
——— **and Carl E. Swanson.** "Transverse" acoustic waves in rigid tubes—618
Hatch, Graham T. Yield of alpha-particles from beryllium bombarded by protons—165
Haworth, F. E. An x-ray test of superstructure in $Fe\text{-}Ni_3$—313(A), 693
Haworth, L. J. and L. D. P. King. Excitation function for the disintegration of Li^7 under bombardment by low energy protons—38
——— **and J. D. P. King.** Stopping power of lithium for low energy protons—48
Heaps, C. W. Measurements of magnetic viscosity in iron—288
Heitler, W. Remarks on nuclear disintegrations by cosmic rays—873
Hellund, E. J. (see Uehling, E. A.)—479(L)
Henderson, J. E. (see Fleming, G.)—241(A)
——— (see Rubens, S. M.)—238(A)
——— **and S. M. Rubens.** Probe investigation of anode spots—238(A)
Herb, R. G. (see Bernet, E. J.)—398
Hershey, Allen V. Measurements of the mobility of potassium ions at high field intensity and low pressure—237(A)
——— Mechanism of the positive ion emission from catalysts—242(A)
Herzfeld, Karl F. and Edward Teller. Vapor pressure of isotopes—912
——— (see Lyddane, R. H.)—846
Hicks, J. F. G. (see Wilson, A. J. C.)—87(L)
Hippel, A. von. Electronic conduction in insulating crystals under very high field strength—867(A), 1096
Hipple, John A., Jr. (see Delfosse, J.)—1060
Hirsh, F. R., Jr. Beilby layer on thin ground quartz crystals—238(A)
——— **and J. W. M. DuMond.** X-ray evidence on the nature of the surface layers of thin ground quartz crystals secured with the Cauchois spectrograph—789

Hoffman, J. G. and R. F. Bacher. Photographic effects produced by cadmium and other elements under neutron bombardment—644
Hofstadter, Robert. Photoconductivity in willemite—864(L)
Hoge, Harold J. (see Brickwedde, F. G.)—266
Hoisington, L. E. and G. Breit. Calculation of Coulomb wave functions for high energies—627
Holloway, M. G. and M. Stanley Livingston. Range and specific ionization of alpha-particles—18
Hooley, J. G. (see Wilson, A. J. C.)—87(L)
Houston, W. V. Resonance broadening of spectral lines—237(A), 884
Hubbard, J. C. (see Alleman, R. S.)—313(A)
Hudson, Rosemary. Sources of error in high frequency measurements of the dielectric properties of glass—866(A)
Hudspeth, Emmett and T. W. Bonner. Observation of H^1 and H^3 ranges from the disintegration of deuterium by deuterons—308(L)
Hughes, A. L. and Merle A. Starr. Atomic electron velocities in hydrogen—189
Huntoon, R. D. (see Ellett, A.)—87(L)
Hustrulid, A., P. Kusch and John T. Tate. Dissociation of benzene (C_6H_6), pyridine (C_5H_5N) and cyclohexane (C_6H_{12}) by electron impact—1037
Huxford, W. S. Townsend ionization coefficients in argon photo-tubes—313(A)

Ikawa, M. (see Sagane, R.)—149(L), 542(L), 970(L)

Jacobs, Robert B. Polymorphic transitions in metallic halides—468
——— X-ray diffraction of substances under high pressures—325
James, Hubert M. (see Coolidge, Albert Sprague)—726
——— **and F. L. Yost.** Wave functions for $1s2s\ ^3S$ Li^+—646(L)
Jauncey, G. E. M. and W. A. Bruce. Diffuse scattering of x-rays from piezoelectrically oscillating quartz—163
Jenkins, F. A. (see Worley, R. E.)—305(L)
Jeppesen, C. Rulon. Emission bands in the $3p^1\Pi_{cd}-1s^1\Sigma$ system of the hydrogen molecule—68
Johnson, R. P. Construction of filament surfaces—459
——— Electron optics—867(T)
Johnson, T. H. Cosmic-ray intensity at high elevations in northern latitudes—151
——— Note on the nature of the primary cosmic radiation—385
Jones, A. T. Recent investigations of organ pipes—867(T)
Jordan, W. H. Electrical axis of the heart by direct observation—235(A)

Kakiuchi, Yoshinobu. Increase of x-ray reflection from quartz due to a strong electric field—772(L)
Kalbfell, D. C. Internal conversion of γ-rays in element 43—543(L)
Kamen, Martin D. (see Wilson, Robert R.)—1031
Kamogawa, Hirosi. Structure of oxidized silicon film—91(L)
Kanne, W. R. and G. L. Ragan. Gamma-rays from Li+H—480(L)
Kaplan, Joseph. Identification of auroral radiations—148(L)
——— Preparation and properties of auroral afterflows—176
——— Production of highly vibrating molecules—230(L)
——— Wave-length of the new nitrogen line—541(L)
——— Where does the light of the night sky originate?—241(A)
King, Frederick (see Lowan, Arnold N.)—1109
King, L. D. P. (see Haworth, L. J.)—38, 48
Kinsey, E. L. (see Ellis, J. W.)—599
Kip, Arthur F. Positive-point-to-plane discharge in air at atmospheric pressure—139
Kirby, S. S., N. Smith and T. R. Gilliland. Nature of the ionosphere storm—234(L)
Kirkpatrick, H. A. and J. W. M. DuMond. Shape of the modified Compton line for hydrogen and Ceylon graphite scatterers—802
Knauss, H. P. (see Paul, F. W.)—1072
Knipp, J. K. (see Breit, G.)—652
Knudsen, V. O. and E. Fricke. Absorption of sound in carbon dioxide and in carbon disulphide—238(A)
Kojima, S. (see Sagane, R.)—149(L), 542(L), 970(L)
Konopinski, E. J. and H. A. Bethe. Theory of excitation functions on the basis of the many-body model—130
Kovarik, Alois F. and Norman I. Adams, Jr. Disintegration constant of thorium and the branching ratio of thorium C—413
Krishnan, K. S. and A. Mookherji. Magnetic anisotropy of copper sulphate pentahydrate, $CuSO_4 \cdot 5H_2O$, in relation to its crystal structure. Part II—533: Part III—841
Kroeger, W. J. Binding energy of O^{16}—1048
Kruger, P. Gerald. (see Phillips, L. W.)—839
Kusch, P. (see Hustrulid, A.)—1037
——— (see Millman, S.)—968(L)
Kyropoulos, S. On the viscosity of nonpolar liquids—241(A)

Laird, Elizabeth R. Plan and equipment of Mount Holyoke College—867(T)
Lageman, R. T. (see Slack, F. G.)—358
Landé, Alfred. Transitions between levels spaced almost continuously—940
Langer, Lawrence M. (see Myers, Frank E.)—90(L)
Langer, R. M. Mass of cosmic-ray particles—237(A)
Laporte, Otto. Elastic scattering of Yukawa particles. I.—905
Lifschutz, Harold and O. S. Duffendack. Counting losses in Geiger-Müller counter circuits and recorders—714
Lindsay, George A. (see Whitmer, Robert M.)—988
Livingood, J. J. Investigations in artificial radioactivity—867(T)
——— **and G. T. Seaborg.** Long-lived radioactive silver—88(L)
——— **and G. T. Seaborg.** Long period radioactive zinc—239(A)
——— **and G. T. Seaborg.** Radioactive isotopes of iodine—775

——— **and G. T. Seaborg.** Radioactive isotopes of iron—51
——— **and G. T. Seaborg.** Radioactive manganese isotopes —391
Livingston, M. Stanley (see Holloway, M. G.)—18
Loeb, Leonard B. (see Beckman, J. W.)—862(L)
London, F. On the Bose-Einstein condensation—947
Loughridge, Donald H. (see Trueblood, Harold)—239(A), 545
——— **and N. Kermit Olsen.** Photoelectric long wave-length limit of magnetized iron—239(A)
Lowan, Arnold N. and Frederick King. Note on the evaluation of the earth's temperature arising from radioactivity—1109
Lukens, Charles (see Wood, R. W.)—332
Lyddane, R. H. and K. F. Herzfeld. Lattice vibrations in polar crystals—846

Manley, John H. (see Brickwedde, F. G.)—266
Mann, K. C. (see Smith, H. Grayson)—766
———, **H. Grayson Smith and J. O. Wilhelm.** Effect of magnetic fields on persistent currents in a closed superconducting circuit—314(A)
———, **H. Grayson Smith and J. O. Wilhelm.** Influence of magnetic fields on persistent currents in a closed superconducting circuit—758
Mann, Wilfrid B. Nuclear transformations produced in zinc by alpha-particle bombardment—649
Margenau, Henry. Quadrupole contributions to London's dispersion forces—867(A)
——— **and Kenneth G. Carroll.** Binding energy of Li^6—705
——— **and Warren A. Tyrrell, Jr.** Variational theory of the alpha-particle—422
Maris, H. B. Sidereal daily variation of barometric pressure —478(L)
May, Albert. Potential energies of the alkali halides: Errata and extension of the semi-empirical formula—629
McCormick, W. W. and R. A. Sawyer. Classification of the spectrum of singly ionized tin. Sn II—71
McKeehan, L. W. "Radio"—232(L)
McLay, A. B. (see Crawford, M. F.)—313(A)
McReynolds, A. W. (see B. T. Wright)—231(L)
Mellon, Arthur W. (see Hartig, Henry E.)—646(L)
Merideth, George T. (see Broxon, James W.)—1, 9, 605
Merwe, C. W. van der (see Bacon, R. H.)—315(A)
Meuron, H. J. (see Bradbury, N. E.)—242(A)
Millman, S., P. Kusch and I. I. Rabi. Nuclear magnetic moment of N^{14}—968(L)
Mimno, H. R. (see Pierce, John Alvin)—475
Miyamoto, G. (see Sagane, R.)—542(L), 970(L)
Mohler, Fred L. Number of lines in a series as a function of electron concentration—313(A)
Mookherji, A. (see Krishnan, K. S.)—533, 841
More, Kenneth R. Spectra of the monochlorides of nickel, cobalt and iron—122
Morgan, H. E. and R. B. Dow. Effects of pressure and temperature on the viscosity of monosubstituted toluenes—312(A)
Morgan, Joseph (see Bohn, J. Lloyd)—314(A)
Morgan, K. Z. (see Nielsen, W. H.)—245
Morrison, P. (see Dancoff, S. M.)—149(L)
Morse, Philip M. and Pearl J. Rubenstein. Diffraction of waves by ribbons and by slits—895
Motz, Lloyd and Eugene Feenberg. Spacing of energy levels in light nuclei—1055
Myers, Frank E. and Lawrence M. Langer. Search for an excited state of the H^3 nucleus—90(L)
Myers, R. D. Angular distribution of resonance disintegration products—361

Neddermeyer, Seth H. and Carl D. Anderson. Cosmic-ray particles of intermediate mass—88(L)
Nelson, E. B. (see Underwood, N.)—355
Němejcová, A. and J. Brož. Effect of a direct electric field on Laue diffraction photograms—379
Nielsen, Alvin H. and Harald H. Nielsen. Infra-red absorption spectrum of CD_4—118
Nielsen, Harald H. (see Nielsen, Alvin H.)—118
Nielsen, W. M. and K. Z. Morgan. Absorption of the penetrating component of the cosmic radiation—245
Nier, Alfred O. Isotopic constitution of strontium, barium, bismuth, thallium and mercury—275
Nix, F. C. Order-disorder transformations in alloys—1116(T)
Nordheim, G. (see Nordheim, L. W.)—254
Nordheim, L. W. and G. Nordheim. On the production of heavy electrons—254
Ny, Tsi-Zé and Shang-Yi Ch'en. Pressure shifts of the high terms of the absorption series of Na, Rb, and Cs produced by hydrogen and nitrogen—1045

Obert, Leonard and J. A. Bearden. Effect of chemical combination of *K*-fluorescent x-ray emission lines—1000
Oliphant, M. L. Helium-deuteron and deuteron-deuteron nuclear reactions—corrections—772(L)
Olsen, N. Kermit (see Loughridge, Donald H.)—239(A)
Onsager, L. Initial recombination of ions—554
Oppenheimer, Jacquenette (see Fowler, W. A.)—320
Oppenheimer, J. R. and Robert Serber. On the stability of stellar neutron cores—540(L)

Parkinson, D. B. (see Bernet, E. J.)—398
Parratt, Lyman G. Silver *L* series x-ray spectrum: line widths, wave-lengths, relative intensities, satellites, and widths of energy levels—99
Pasternack, Simon. Note on the fine structure of Hα and Dα—1113(L)
Paul, F. W. and H. P. Knauss. Rotational structure of the $^2\Sigma - {}^3\Pi$ bands of BF—1072
Pauli, W. On asymptotic series for functions in the theory of diffraction of light—924
Pauling, Linus. Nature of the interatomic forces in metals —899
Peierls, R. On a minimum property of the free energy—918
Peoples, J. A., Jr. (see Green, J. B.)—602
Phillips, L. W. and P. Gerald Kruger. Deep terms in Co VI and Ni VII—839
Pierce, John Alvin and H. R. Mimno. Unusual range of radio signals—475
Pitt, A. (see Findlay, J. C.)—506

Pollard, Ernest. Transmutation of scandium by Th C′ alpha-particles—411
——— (see Davidson, W. L., Jr.)—408
Pontecorvo, Bruno. Nuclear isomerism and internal conversion—542(L)
Power, R. B. (see Cobine, J. D.)—312(A)
Powers, Philip N. Magnetic scattering of neutrons—827
Purcell, Edward M. Focusing of charged particles by a spherical condenser—818

Quimby, S. L. (see Hardy, T. C.)—217
——— (see Siegel, Sidney)—76
——— **and Sidney Siegel.** Variation of the elastic constants of crystalline sodium with temperature between 80°K and 210°K—293

Rabi, I. I. (see Millman, S.)—968(L)
Ragan, G. L. (see Kanne, W. R.)—480(L)
Raines, Barbara. Variation with heat treatment of the cold resistance of nickel—481(L)
Ramsey, W. E. (see Swann, W. F. G.)—229(L)
Rarita, William and Zaka I. Slawsky. Nuclear two-body variational problem—1053
Read, T. A. Internal friction of metallic crystals—389(L)
Reiling, Victor G. (see Collins, George B.)—499
Ridenour, L. N. (see White, M. G.)—314(A)
Roberts, R. B. (see Rumbaugh, L. H.)—657
Rock, George D. (see Fox, Francis E.)—223
Rosenthal, Jenny E. Virtual levels of Be^8 and the alpha-particle model—315(A)
Rubens, S. M. (see Henderson, J. E.)—238(A)
——— **and J. E. Henderson.** Spherical ground joints for vacuum systems—238(A)
Rubenstein, Pearl J. (see Morse, Philip M.)—895
Rubinowicz, A. On the anomalous propagation of phase in the focus—931
Ruhlig, Arthur J. Search for gamma-rays from the deuteron-deuteron reaction—308(L)
Rumbaugh, L. H., R. B. Roberts and L. R. Hafstad. Nuclear transmutations of the lithium isotopes—657
Rusk, Rogers D. Collector electrode currents in discharges of different current density—865(A)

Sagane, R., S. Kojima and M. Ikawa. Radioactive As isotopes—149(L)
———, **Shoji Kojima, Goro Miyamoto and M. Ikawa.** Neutron induced radioactivity in columbium—970(L)
———, **S. Kojima, G. Miyamoto and M. Ikawa.** Preliminary report on the radioactivity produced in Y, Zr and Mo—542(L)
St. Helens, N. J. (see Wilkins, T. R.)—783
Sargent, B. W. β-rays of actinium B and actinium C″ particle spectra—232(L)
Sawyer, R. A. (see McCormick, W. W.)—71
Schein, Marcel and Volney C. Wilson. Evidence for the production of penetrating secondary cosmic-ray particles in the atmosphere—304(L)
Schiff, L. I. Excited state of He^3—92(L), 235(A)
——— On the paths of ions in the cyclotron—1114(L)
Schneider, Edwin G. Secondary emission of beryllium—185
Schneider, W. A. (see Waldman, B.)—543(L), 1017
Schremp, E. J. I. General theory of the earth's shadow effect of cosmic radiation—153
——— II. Simple shadow cone of cosmic radiation—158
Schultz, H. L. Vacuum tube high voltage stabilizing circuit of d.c. sources—314(A)
Seaborg, G. T. (see Grahame, D. C.)—240(A)
——— (see Livingood, J. J.)—51, 88(L), 239(A), 391, 775
——— (see Segrè, E.)—772(L)
Seeger, R. J. and E. Teller. On the electrical breakdown of the alkali halides—515
Segrè, E. and G. T. Seaborg. Nuclear isomerism in element 43—772(L)
Seitz, Frederick. Nature of lattice defects in silver bromide crystals—1111
Serber, R. Transition effects of cosmic rays in the atmosphere—317
——— (see Oppenheimer, J. R.)—540(L)
Shaw, A. E. New precision method for the determination of e/m for electrons—193
Sherr, Rubby (see White, M. G.)—314(A)
———, **Lincoln G. Smith and Walker Bleakney.** On the existence of H^3—388(L)
Shortley, George H. and Bernard Fried. Extension of the theory of complex spectra—739
——— **and Bernard Fried.** Structure of the configurations of high azimuthal quantum number in Cu II and the rare gases—749
Siegel, Sidney (see Quimby, S. L.)—293
——— **and S. L. Quimby.** Thermal expansion of crystalline sodium between 80°K and 290°K—76
Skaggs, Lester S. (see Allison, Samuel K.)—171
Slack, F. G. (see Underwood, N.)—355
———, **R. T. Lageman and N. Underwood.** Magneto-optical activity of crystalline nickel sulfate, α-hexahydrate—358
Slawsky, Zaka I. (see Rarita, William)—1053
Smith, H. Grayson (see Findlay, J. C.)—506
——— (see Mann, K. C.)—314(A), 758
——— **and K. C. Mann.** Relaxation effects connected with the transition between the superconducting and normal states—766
Smith, Lincoln G. (see Sherr, Rubby)—388 (L)
Smith, N. (see Kirby, S. S.)—234(L)
Smith, Nicholas M., Jr. (see Allison, Samuel K.)—171
Starr, Chauncey. Pressure coefficient of thermal conductivity of metals—210
Starr, Merle A. (see Hughes, A. L.)—189
Staub, H. (see Stephens, W. E.)—237(A)
——— **and W. E. Stephens.** α-Particles from the disintegration of lithium by deuterons—236(A)
Stearns, J. C. (see Froman, Darol K.)—315(A), 969(L)
Stephens, W. E. (see Staub, H.)—236(A)
——— **and H. Staub.** Neutrons from the break-up of He^5—237(A)
Stevenson, A. F. and M. F. Crawford. Lower limit for the theoretical energy of the normal state of helium—375
——— **and M. F. Crawford.** Theoretical lower bound for the energy of the normal state of helium—314(A)
Stout, J. W. (see Giauque, W. F.)—147(L)

Strain, Charles V. Proton induced radioactivities. II. Nickel and copper targets—1021
Strong, John. New radiation pyrometer for the measurement of low and high temperatures—242(A)
Stueckelberg, E. C. G. Rigorous theory of interaction between nuclear particles—889
Stücklen, Hildegard (see Carr, Emma P.)—865(A)
Swann, W. F. G. Hard and soft component of cosmic radiation in terms of a common primary background—307(L)
——— **and W. E. Ramsey.** Cosmic-ray electron showers in a mine 100 feet below sea level—229(L)
Swanson, Carl E. (see Hartig, Henry E.)—618
Szczeniowski, S. and St. Ziemecki. Fluctuations of residual ionization current at great depths—233(L)

Tappert, J. G. Experimental investigation of de Broglie's equation—1085
Tate, John T. (see Hustrulid, A.)—1037
Teller, E. (see Hafstad, L. R.)—681
——— (see Herzfeld, K. F.)—912
——— (see Seeger, R. J.)—515
Thomas, Charles D. Static interaction of charged particles—367
Thomas, L. H. Paths of ions in the cyclotron. I. Orbits in the magnetic field—580
——— Paths of ions in the cyclotron. II. Paths in the combined electric and magnetic fields—588
Thompson, Julian L. Solar diurnal variation of cosmic-ray intensity as a function of latitude—93
Thosar, B. V. Physical state of chromium impurity in corundum—233(L)
Tomboulian, D. H. New terms in the spectrum of Na III—347
——— Spectra of Rb III and Sr IV—350
——— **and R. F. Bacher.** On the hyperfine structure interval rule in indium—446
Tonks, L. New form of the electromagnetic energy equation when free charged particles are present—863(L)
——— Rate of vaporization of mercury from an anchored cathode spot—634
Trichel, G. W. Mechanism of the negative point to plane corona near onset—1078
——— Mechanism of the positive and negative point coronas in air at atmospheric pressure—242(A)
Trueblood, Harold and Donald H. Loughridge. Angular distributions of recoil and photoelectrons produced by 300 to 800 kv x-rays in nitrogen—239(A)
——— **and Donald H. Loughridge.** Scattering and photoelectric absorption of high voltage x-rays in nitrogen—545
Turnbull, John C. and H. E. Farnsworth. Inelastic scattering of slow electrons from a silver single crystal—509
Tyrrell, Warren A., Jr. (see Margenau, Henry)—422

Uehling, E. A. and E. J. Hellund. Viscosity of helium—479(L)
Uhlenbeck, G. E. Properties of gases at low temperatures—1116(T)
Underwood, N. (see Slack, F. G.)—358
———, **F. G. Slack and E. B. Nelson.** Optical activity of crystalline nickel sulfate α-hexahydrate—355
Urey, H. C. Separation of the isotopes of nitrogen—1116(T)

Vernon, E. L. (see Coolidge, Albert Sprague)—726

Waddel, R. C. (see Waldman, B.)—543(L), 1017
Waldman, B., R. C. Waddel, D. Callihan and W. A. Schneider. Location of resonances in boron plus proton reactions—543(L)
———, **R. C. Waddel, D. Callihan and W. A. Schneider.** Resonance processes in the disintegration of boron by protons—1017
Wall, C. N. Atomic distribution function for liquid sodium—1062
Watson, W. W. High pressure arc as spectroscopic source—865(A)
——— Spectrum of lead hydride—1068
Weeks, Dorothy W. and George R. Harrison. New survey of the spectrum of the international iron arc in the range 10,000 to 2000A—312(A)
Wentzel, G. Angular spread of hard cosmic-ray showers—869
Wertenstein, L. Remarks on the article by H. R. Crane and J. Halpern—"New experimental evidence for the neutrino"—306(L)
Wheeler, Mary A. Paramagnetic susceptibility of copper-nickel and zinc-nickel alloys—867(A)
Whitaker, Martin D., Harold G. Beyer and John R. Dunning. Scattering of slow neutrons by paramagnetic salts—771(L)
White, M. G., L. A. Delsasso, Rubby Sherr and L. N. Ridenour. Threshold energies for some (p,n) reactions—314(A)
Whitmer, Robert M. and George A. Lindsay. Anomalous dispersion of x-rays in calcite—988
Wilhelm, J. O. (see Findlay, J. C.)—506
——— (see Mann, K. C.)—314(A), 758
Wilkins, T. R. and D. P. Crawford. Cloud-chamber study of the alpha-rays of actino-uranium—316(A)
——— **and A. J. Dempster.** Radioactive isotope of samarium—315(A)
——— **and H. J. St. Helens.** Grain-spacing of alpha-ray, proton and deuteron tracks in photographic emissions—783
Williams, D. T. and L. P. Granath. Hyperfine structure of boron, yttrium, rhodium and palladium—338
Williams, Dudley. S–H frequency of the mercaptans—504
Williams, Robley C. Determination of e/m from the Hα − Dα interval—568
——— Fine structure of Hα and Dα under varying discharge conditions—558
Wilson, Arthur J. C. Heat capacity of Rochelle salt between −30° and +30°C—1103
———, **J. F. G. Hicks and J. G. Hooley.** Heat capacity of Rochelle salt—87(L)
Wilson, Robert R. Magnitude of accelerated current in the cyclotron—240(A)
——— **and Martin D. Kamen.** Internal targets in the cyclotron—1031
Wilson, Volney C. (see Schein, Marcel)—304(L)

Winsor, L. P. (see Cobine, J. D.)—312(A)
Wood, R. W. and Charles Lukens. Optical properties of the alkali metals—332
Worley, R. E. and F. A. Jenkins. New Rydberg series in N_2—305(L)
Wright, B. T. and A. W. McReynolds. Beta-rays from radium E—231(L)
Yost, F. L. (see James, Hubert M.)—646(L)
Young, R. T., Jr. Transparency of sea-water in the Pacific Ocean—866(A)

Ziemecki, St. (see Szczeniowski, S.)—233(L)
Zisman, W. A. (see Goranson, Roy W.)—544(L)
Zwicky, F. On neutron stars—242(A)

Analytic Subject Index to Volume 54

References with (A) are to abstracts of papers presented at meetings of the American Physical Society. References with (L) are to Letters to the Editor.

Absorption and reflection of light (see also **Spectra, absorption**)
Transparency of sea-water, R. T. Young, Jr.—866(A)

Acoustics
Absorption in CO_2 and CS_2, V. O. Knudsen, E. Fricke—238(A)
Diffraction of waves by ribbons and slits, P. M. Morse, P. J. Rubenstein—895
"Transverse" waves in rigid tubes, H. E. Hartig, C. E. Swanson—618
Ultrasonic radiation field in liquid media, F. E. Fox, G. D. Rock—223
Ultrasonic reflection losses, R. S. Alleman, J. C. Hubbard—313(A)
Velocity of sound in liquid He, J. C. Findlay, A. Pitt, H. G. Smith, J. O. Wilhelm—506

Afterglow
Highly vibrating molecules, J. Kaplan—230(L)

Arcs (see **Discharge of electricity in gases**)

Astrophysics
Deuterons by $_1H^1$ combination, H. A. Bethe, C. L. Critchfield—248; 862(L)
Neutron stars, F. Zwicky—242(A)
Stability of stellar neutron cores, J. R. Oppenheimer, R. Serber—540(L)
Theory of novae, G. Gamow—480(L)

Atomic structure (see also **Energy states of atoms; Spectra**)
Atomic electron velocities in hydrogen, A. L. Hughes, M. A. Starr—189

Aurora
Identification of radiations, J. Kaplan—148(L)
Preparation and properties of afterglows, J. Kaplan—176; 230(L)

Biophysics
Electrical axis of heart, W. H. Jordan—235(A)
Inhalation of radioactive air, R. D. Evans, C. Goodman—866(A)
Vitrification and crystallization of living cells, A. Goetz, S. S. Goetz—236(A)

Broadening of spectral lines
Resonance broadening, W. V. Houston—237(A); 884

Compton effect (see **X-rays, diffraction, scattering**)

Conductivity, electrical (see **Electrical conductivity; Discharge of electricity in gases**)

Constants, physical, standards
Evaluation of, R. A. Beth—865(A)
Validity of x-ray methods of determining e, V. L. Bollman, J. W. M. DuMond—1005

Contact potentials
Between Ba and Mg, P. A. Anderson—753; R. J. Cashman—971(L)
And photoelectric effect of semi-conductors, E. U. Condon—1089

Cosmic radiation
Absorption of shower-producing component in Fe and Pb, J. Crudup—483
Angular spread of showers, G. Wentzel—869
Diurnal variation, function of latitude, J. L. Thompson—93
Earth's shadow, theory of, E. J. Schremp—153; 158
At great depths, S. Szczeniowski, St. Ziemecki—233(L)
Hard and soft components common, primary background, W. F. G. Swann—307(L)
Heavy electrons, production of, L. W. Nordheim, G. Nordheim—254
At high elevations in northern latitudes, T. H. Johnson—151
Ionization in air at high pressures, J. W. Broxon, G. T. Merideth—1; 9; 605
Mass of particles, R. M. Langer—237(A)
Nature of primary radiation, T. H. Johnson—385
Neutrons in showers, D. K. Froman, J. C. Stearns—969(L)
Particles of intermediate mass, S. H. Neddermeyer, C. D. Anderson—88(L)
Penetrating component, absorption of, W. M. Nielsen, K. Z. Morgan—245
Penetrating secondary particles, M. Schein, V. C. Wilson—304(L)
Radiative losses by particles, S. B. Batdorf, E. W. Beth—237(A)
Showers, altitude variation of, D. K. Froman, J. C. Stearns—315(A)
Showers in a mine, W. F. G. Swann, W. E. Ramsey—229(L)
Sidereal time variation, H. Alfvén—97
Temperature of cosmic rays, P. M. S. Blackett—973(L)
Transition effects, R. Serber—317
World-wide changes, S. E. Forbush—975

Crystal structure
Beilby layer on quartz crystals, F. R. Hirsh, Jr.—238(A)
Direct determination of crystal structure, M. Avrami—300; 1114(L)
Nature of surface layers of ground quartz, F. R. Hirsh Jr., J. W. M. DuMond—789
Superstructure in $FeNi_3$, F. E. Haworth—313(A); 693
Surface layers in calcite crystals, V. L. Bollman, J. W. M. DuMond—238(A)

Crystalline state
Atomic vibrations of Zn-Cu alloy, M. L. Fuller—388(L)
Crystal fields in ethylsulphates, C. B. Ellis, H. Hall—478(L)
Defect in AgBr crystals, F. Seitz—1111
Electrical breakdown of alkali halides, R. J. Seeger, E. Teller—515
Electronic conduction in insulating crystals, A. von Hippel—867(A); 1096

Crystalline state (continued)
Filament surfaces; nature of, R. P. Johnson—459
Heat capacity of Rochelle salt, A. J. C. Wilson—1103
Heat capacity of Rochelle salt, A. J. C. Wilson, J. F. G Hicks, J. G. Hooley—87(L)
Interatomic forces in metals, L. Pauling—899
Internal friction of metallic crystals, T. A. Read—389(L)
Magnetic anisotropy of $CuSO_4 \cdot 5H_2O$, K. S. Krishnan, A. Mookherji—533; 841
Polymorphic transitions in metallic halides, R. B. Jacobs—468
Potential energies of alkali halides, A. May—629
State of Cr impurity in corundum, B. V. Thosar—233(L)
Temperature changes accompanying field emission, G. Fleming, J. E. Henderson—241(A)
Vibration of a body-centered cubic lattice, P. Fine—239(A)
Vibrations in polar crystals, R. H. Lyddane, K. F. Herzfeld—846
X-ray diffraction under high pressures, R. B. Jacobs—325

Dielectrics and dielectric properties
Errors in measurement at high frequencies, R. Hudson—866(A)
Diffraction of light
Asymptotic series for functions in the theory, W. Pauli—924
By ribbons and by slits, P. M. Morse, P. J. Rubenstein—895
Diffusion
In centrifugal force field, W. J. Archibald—371
Discharge of electricity in gases
Currents to collector electrodes, R. D. Rusk—865(A)
Ignition potential at low pressure, G. H. Fett—389(L)
Initial recombination of ions, L. Onsager—554
Ion currents in air at high pressure, J. W. Broxon, G. T. Merideth—1; 9; 605
Point to plane corona, G. W. Trichel—242(A); 1078
Positive ion emission from catalysts, A. V. Hershey—242(A)
Positive-point-to-plane discharge, A. F. Kip—139
Probe investigation of anode spots, J. E. Henderson, S. M. Rubens—238(A)
Reignition at high pressures, J. D. Cobine, R. B. Power, L. P. Winsor—312(A)
Spark breakdown potentials in A, N_2, and H_2, F. Ehrenkranz—239(A)
Townsend coefficients for pure H_2, D. H. Hale—241(A)
Townsend ionization coefficients, W. S. Huxford—313(A)
Vaporization of Hg from cathode spot, L. Tonks—634
Disintegration of nucleus, transmutations (see also **Radioactivity**)
α-particles from Li^7 (d,n) Be^8 reaction, H. Staub, W. E. Stephens—236(A)
Angular distribution of products, R. D. Myers—361
By cosmic rays, W. Heitler—873
Capture of orbital electrons, L. W. Alvarez—486
Distribution of H^1 from $d-d$ reaction, A. Ellett, R. D. Huntoon—87(L)
Energy change in $_4Be^9$ $(p,\alpha)_3Li^6$ reaction, S. K. Allison, L. S. Skaggs, N. M. Smith, Jr.—171
Excitation function of $_4Be^9$ $(p,\alpha)_3Li^6$ reactions, G. T. Hatch—165
γ-rays from the $_1H^2$ $_1H^2$ reaction, A. J. Ruhlig—308(L)
γ-rays from F+H, E. J. Bernet, R. G. Herb, D. B. Parkinson—398
γ-rays from Li+H^1, W. R. Kanne, G. L. Ragan—480(L)
$_2He^3-{}_1H^2$ and $_1H^2-{}_1H^2$ reactions, M. L. Oliphant—772(L)
K-electron capture in Be^7, G. Breit, J. K. Knipp—652
Of Li isotopes, yield curves, L. H. Rumbaugh, R. B. Roberts, L. R. Hafstad—657
Of Li^7; excitation function for protons, L. J. Haworth, L. D. P. King—38
Neutrons from break-up of He^6, W. E. Stephens, H. Staub—237(A)
H^1 and H^3 ranges from H^2+H^2, E. Hudspeth, T. W. Bonner—308(L)
Range and specific ionization of α-particles, M. G. Holloway, M. S. Livingston—18
Resonance processes in B+H reaction, B. Waldman, R. C. Waddel, D. Callihan, W. A. Schneider—543(L), 1017
Of Sc by α-particles, E. Pollard—411
Stopping power of Li for protons, L. J. Haworth, L. D. P. King—48
Theory of excitation, E. J. Konopinski, H. A. Bethe—130
Threshold energies (p,n) reactions, M. G. White, L. A. Delsasso, R. Sherr, L. N. Ridenour—314(A)
Of Ti by α-particles, W. L. Davidson, Jr., E. Pollard—408
Dissociation
Of C_6H_6, C_5H_5N and C_6H_{12} by electron impact, A. Hustrulid, P. Kusch, J. T. Tate—1037
Of C_2H_2D by electron impact, J. Delfosse, J. A. Hipple, Jr.—1060
Doppler effect
Transverse effect; theory of relativity, C. J. Davisson—90(L)

Elasticity
Coefficients, dependence on temperature, L. Brillouin—916
Constants of crystalline Na variation with temperature, S. L. Quimby, S. Siegel—293
Electrical conductivity and resistance
Breakdown phenomena in semi-conductors, J. Frenkel—647(L)
Electrical breakdown of alkali halides, R. J. Seeger, E. Teller—515
In crystals at high fields, A. von Hippel—867(A)
Of insulating crystals, A. von Hippel—867(A); 1096
Magnetic fields and persistent currents in superconducting circuit, K. C. Mann, H. G. Smith, J. O. Wilhelm—314(A); 758

Relaxation effects in superconductivity, H. G. Smith, K. C. Mann—766
Resistance of Ni, variation with heat treatment, B. Raines—481(L)
Electrical oscillations and waves
Transmission of damped waves through tubes, H. E. Hartig, A. W. Mellon—646(L)
Electromagnetic theory
Energy equation for field and free charges, L. Tonks—863(L)
Of material media, C. Eckart—920
Electron diffraction (see also **Electrons, scattering of**)
Test of de Broglie's equation, J. G. Tappert—1085
Electron optics
Studies of thoriated W, A. J. Ahearn, J. A. Becker—448
Electrons (see also ***E/m***)
Heavy electrons, production of, L. W. Nordheim, G. Nordheim—254
Spin greater than $\frac{1}{2}$, Dirac equation, A. Bramley—314(A)
Electrons in metals (see **Crystalline state**)
Electrons, scattering of (see **Scattering of electrons, neutrons and ions, Electron diffraction**)
Electrons, secondary
From Be films, E. G. Schneider—185
Electrostatics
Interaction of charged particles; Born-Infeld equations, C. D. Thomas—367
E/m
β-rays from RaE, B. T. Wright, A. W. McReynolds—231(L)
Focusing of charged particles by a spherical condenser, E. M. Purcell—818
From the Hα − Dα interval, R. C. Williams—568
Method for its determination, A. E. Shaw—193
From refraction of x-rays in diamond, J. A. Bearden—698
Value from recent data, R. T. Birge—972(L)
Energy states of atoms (see also **Spectra, atomic**)
Of He, theoretical lower bound, A. F. Stevenson, M. F. Crawford—314(A); 375
Energy states of nucleus (see also **Nucleus**)
Binding energy of Li^6, H. Margenau, K. G. Carroll—705
Binding energy of O^{16}, W. J. Kroeger—1048
Coulomb energy of light nuclei, H. A. Bethe—436
Excited state of He^3, L. I. Schiff—92(L); 235(A)
Of H^3 nucleus, F. E. Myers, L. M. Langer—90(L)
Levels in light nuclei, spacing of, L. Motz, E. Feenberg—1055
Symmetry effects in spacing levels, J. Bardeen, E. Feenberg—809
Two-body variational problem, W. Rarita, Z. I. Slawsky—1053
Variation theory of α-particle, H. Margenau, W. A. Tyrrell, Jr.—422
Errors of measurement
Physical constants, R. A. Beth—865(A)
Evaporation
Latent heat for liquid Na, C. N. Wall—1062
Of Hg from cathode spot, L. Tonks—634

Ferromagnetism (see **Magnetic properties**)
Field currents
Temperature changes, G. Fleming, J. E. Henderson—241(A)
Films, properties of
Electrical properties of multilayers, R. W. Goranson, W. A. Zisman—544(L)
Of SiO_2, Structure of films, Hirosi Kamogawa—91(L)
Fine structure (see **Spectra, etc. and Hyperfine structure**)
Of Hα and Dα, R. C. Williams—558

Geophysics
Constitution of gases at Kilauea volcano, S. S. Ballard—236(A)
Disintegration constant of Th, A. F. Kovarik, N. I. Adams, Jr.—413
Earth's temperature, A. N. Lowan, F. King—1109

High voltage tubes and machines
Internal targets in cyclotrons, R. R. Wilson, M. D. Kamen—1031
Magnitude of current in cyclotron, R. R. Wilson—240(A)
Paths of ions in cyclotron, L. H. Thomas—580; 588; L. I. Schiff—1114(L)
Hyperfine structure
Of B, Y, Rh and Pd, D. T. Williams, L. P. Granath—338
Interval rule in In, D. H. Tomboulian, R. F. Bacher—446

Instruments (see **Methods and instruments**)
Ionization by particles (see also **Ionization potentials**)
By high speed electrons in N_2, R. B. Brode, D. R. Corson—238(A)
Range and specific ionization of α-particles, M. G. Holloway, M. S. Livingston—18
Townsend ionization coefficients, W. S. Huxford—313(A)
Ionization potentials
Of C_6H_6, C_5H_5N and C_6H_{12} by electron impact, A. Hustrulid, P. Kusch, J. T. Tate—1037
Ionization by radiation (see **Photoionization**)
Ionosphere
Nature of ionosphere storm, S. S. Kirby, N. Smith, T. R. Gilliland—234(L)
Ions, mobility
Of liquids electrified by bubbling, S. Chapman—520; 528
Of K ions at low pressure, A. V. Hershey—237(A)
Isomerism in nuclei
In element 43, E. Segrè, G. T. Seaborg—772(L)
And internal conversion, B. Pontecorvo—542(L)
In Rh, E. C. Crittenden, Jr., R. F. Bacher—862(L)
Isotopes
Existence of H^3, R. Sherr, L. G. Smith, W. Bleakney—388(L)
Of Sr, Ba, Bi, Tl and Hg, A. O. Nier—275
Vapor pressure of, K. F. Herzfeld, E. Teller—912

Liquid
Atomic distribution function for Na, C. N. Wall—1062
Velocity of sound in liquid He, J. C. Findlay, A. Pitt, H. G. Smith, J. O. Wilhelm—506

Liquid (continued)
Vibrational-rotational transitions in H_2O in solvents, J. W. Ellis, E. L. Kinsey—599

Magnetic properties
Anisotropy of $CuSO_4 \cdot 5H_2O$, K. S. Krishnan, A. Mookherji—533; 841
Domain theory, reversible susceptibility, W. F. Brown, Jr.—279
Ferromagnetic colloid, magnetic structures, W. C. Elmore—309(L); 1092
Generalization of theory, F. Bitter—79
Magnetic viscosity in Fe, C. W. Heaps—288
Susceptibility of Cu-Ni and Zn-Ni alloys, M. A. Wheeler 807(A)
Thermal energy change with magnetization, T. C. Hardy, S. L. Quimby—217

Magneto-optical effects
Of α-$NiSO_4 \cdot 6H_2O$, F. G. Slack, R. T. Lageman, N. Underwood—358

Mechanics, quantum—general
Calculation of Coulomb wave functions, L. E. Hoisington, G. Breit—627
Derivation of Maxwell-Boltzmann law, E. U. Condon—937
Matrices for covariant systems, R. J. Duffin—1114
Method for large perturbations, H. A. Bethe—955
Perturbation method, use of boundary conditions, H. Froehlich—945
Theory of neutral particle, W. H. Furry—56
Wave functions for $1s2s^3S$ Li^+, H. M. James, F. L. Yost—646(L)

Mechanics, quantum—molecular structure and spectra
Transitions between levels, A. Landé—940

Mechanics, statistical
Bose-Einstein condensation, F. London—947
Derivation of Maxwell-Boltzmann law, E. U. Condon—937
Minimum property of free energy, R. Peierls—918

Metals (see **Crystalline state**)

Meteorology
Atmospheric condensation nuclei, N. E. Bradbury, H. J. Meuron—242(A)
Nature of ionosphere storm, S. S. Kirby, N. Smith, T. R. Gilliland—234(L)
Polarigraph for sky light investigations, W. M. Cohn—241(A)
Sidereal variation of barometric pressure, H. B. Maris—478(L)
Source of night sky light, J. Kaplan—241(A)

Methods and instruments
Analysis of fertilizers, S. S. Ballard—312(A)
Calculation of Coulomb wave functions, L. E. Hoisington, G. Breit—627
Calculation of fluctuations, R. Ellickson—572
Condensation in cloud chamber, J. W. Beckman, L. B. Loeb—862(L)
Counting losses in G-M counters, H. Lifschutz, O. S. Duffendack—714
Dielectric constants at high frequencies, R. Hudson—866(A)
Diffusion in centrifugal force field, W. J. Archibald—371
Direct determination of crystal structure, M. Avrami—300
Electrical axis of heart by direct observation, W. H. Jordan—235(A)
E/m, determination of, A. E. Shaw—193
Ferromagnetic colloid, magnetic structure, W. C. Elmore—309(L)
Focusing of charged particles by a spherical condenser, E. M. Purcell—818
Geiger point counter, performance of, J. L. Bohn, J. Morgan—314(A)
Grain-spacing of α-ray, tracks in photographic emulsions, T. R. Wilkins, H. J. St Helens—783
Ground joints for vacuum systems, S. M. Rubens, J. E. Henderson—238(A)
High voltage stabilizing circuit, H. L. Schultz—314(A)
Internal targets in cyclotrons, R. R. Wilson, M. D. Kamen—1031
Large perturbations; treatment of, H. A. Bethe—955
Magnitude of current in cyclotron, R. R. Wilson—240(A)
Motion picture polarigraph, W. M. Cohn—241(A)
Paths of ions in cyclotron, L. H. Thomas—580; 588; L. I. Schiff—1114(L)
Photographic graininess, W. O. Gould, A. Goetz, A. Dember—240(A)
Potential curves from spectroscopic data, A. S. Coolidge, H. M. James, E. L. Vernon—726
Production of collimated beams of slow neutrons, L. W. Alvarez—609
Radiation pyrometer for low and high temperatures, J. Strong—242(A)
Separation of radioactive substances, D. C. Grahame, G. T. Seaborg—240(A)
Thermal expansion; low temperatures, S. Siegel, S. L. Quimby—76

Mobility of ions (see **Ions, mobility**)

Molecular structure and constants (see also **Spectra molecular**)
Potential curves from spectroscopic data, A. S. Coolidge H. M. James, E. L. Vernon—726

Neutrino (see also **Radioactivity**)
Experimental evidence for it, H. R. Crane, J. Halpern—306(L); L. Wertenstein—306(L)
Theory of neutral particle, W. H. Furry—56

Neutrons
From break-up of He^5, W. E. Stephens, H. Staub—237(A)
Neutron stars, F. Zwicky—242(A)
Photographic effects of elements under neutron bombardment, J. G. Hoffman, R. F. Bacher—644
Production of collimated beams, L. W. Alvarez—235(A); 609
Scattering cross sections of H_2, N_2 and H_2O, F. G. Brickwedde, J. R. Dunning, H. J. Hoge, J. H. Manley—266

Nuclear moments and spin (see also **Hyperfine structure**)
Of N^{14}, S. Millman, P. Kusch, I. I. Rabi—968(L)
Nucleus (see also **Disintegration of nucleus; Energy states of nucleus**)
α-particle model, L. R. Hafstad, E. Teller—681
Be^8 and α-particle model, J. E. Rosenthal—315(A)
Deuterons by $_1H^1$ combination, H. A. Bethe, C. L. Critchfield—248; 862(L)
Energy levels in light nuclei, L. Motz, E. Feenberg—1055
Interaction between nuclear particles, theory of, E. C. G. Stueckelberg—889
Isomerism and internal conversion, B. Pontecorvo—542(L)
Symmetry effects in spacing levels, J. Bardeen, E. Feenberg—809
Theory of excitation, E. J. Konopinski, H. A. Bethe—130
Two-body variational problem, W. Rarita, Z. I. Slawsky—1053
Variation theory of α-particle, H. Margenau, W. A. Tyrrell, Jr.—422

Optical constants and properties
Activity of crystalline α-$NiSO_4 \cdot 6H_2O$, N. Underwood, F. G. Slack, E. B. Nelson—355
Of alkali metals, R. W. Wood, C. Lukens—332
Refractive index of air, D. Bender—179
Optical theory (see also **Diffraction of light**)
Anomalous propagation of phase, A. Rubinowicz—931
Diffraction theory, W. Pauli—924
Theory of dispersion, force of excitation, P. P. Ewald—893

Photoconductivity
In willemite, R. Hofstadter—864(L)
Photoelectric effect and properties; cells
Long wave-length limit of magnetized iron, D. H. Loughridge, N. K. Olsen—239(A)
In semi-conductors, effect of contact potentials, E. U. Condon—1089
Photography
Graininess of photographic emulsions, A. Dember, A. Goetz, W. O. Gould—240(A)
Grain-spacing of α-ray tracks in photographic emulsions, T. R. Wilkins, H. J. St Helens—783
Instrument for determining graininess, W. O. Gould, A. Goetz, A. Dember—240(A)
Photoionization
Analysis of high gradient, high pressure, γ-ray ionization in air, J. W. Broxon, G. T. Merideth—9
γ-rays in air at high pressures, J. W. Broxon, G. T. Merideth—1

Quantum mechanics (see **Mechanics, quantum**)

Radiation
Čerenkov radiation; two million volt electrons, G. B. Collins, V. G. Reiling—499
Radio
Unusual range of signals, J. A. Pierce, H. R. Mimno—475
Radioactivity (see also **Disintegration of nucleus**)
α-rays of actino-uranium, T. R. Wilkins, D. P. Crawford—316(A)
β-ray spectrum of I^{128}, R. H. Bacon, E. N. Grisewood, C. W. van der Merwe—315(A)
β-rays of Ac B and Ac C″, B. W. Sargent—232(L)
β-rays from Ra E, B. T. Wright, A. W. McReynolds—231(L)
Calculation of fluctuations, R. Ellickson—572
Capture of orbital electrons, L. W. Alvarez—486
In Co, neutron induced, R. Sagane, S. Kajima, G. Miyamoto, M. Ikawa—970(L)
Disintegration constant of Th, branching ratio of Th C, A. F. Kovarik, N. I. Adams, Jr.—413
Earth's temperatures, A. N. Lowan, F. King—1109
Grain-spacing of α-ray tracks in photographic emulsions, T. R. Wilkins, H. J. St Helens—783
Inhalation of radioactive air, R. D. Evans, C. Goodman—866(A)
Internal conversion of arbitrary multipole order, S. M. Dancoff, P. Morrison—149(L)
Internal conversion in element 43, D. C. Kalbfell—543(L)
Of I isotopes, J. J. Livingood, G. T. Seaborg—775
Of Fe isotopes, J. J. Livingood, G. T. Seaborg—51
Isomerism in element 43, E. Segrè, G. T. Seaborg—772(L)
Isomerism and internal conversion, B. Pontecorvo—542(L)
Isomerism in Rh, E. C. Crittenden, Jr., R. F. Bacher—862(L)
Isotopes of As, R. Sagane, S. Kojima, M. Ikawa—149(L)
K-electron capture in Be^7, G. Breit, J. K. Knipp—652
Of Mn isotopes, J. J. Livingood, G. T. Seaborg—391
In Ni and Cu by $_1H^1$, C. V. Strain—1021
Ra and Th in air, C. Goodman, R. D. Evans—866(A)
Of Ra-Cl, D. C. Grahame—972(L)
Range and specific ionization of α-particles, M. G. Holloway, M. S. Livingston—18
Of Sm^{148}, T. R. Wilkins, A. J. Dempster—315(A)
Separation of radioactive substances, D. C. Grahame, G. T. Seaborg—240(A)
Of Ag, J. J. Livingood, G. T. Seaborg—88(L)
Use of term "radio," L. W. McKeehan—232(L)
In Y, Zr and Mo, R. Sagane, S. Kojima, G. Miyamoto, M. Ikawa—542(L)
Of Zn, J. J. Livingood, G. T. Seaborg—239(A)
In Zn by α-particle bombardment, W. B. Mann—649
In Zn and Se by $_1H^1$, J. H. Buck—1025
Raman effect
In dibromofluoromethane, G. Glockler, J. H. Bachmann—970(L)
Recombination
Initial recombination of ions, L. Onsager—554
Relativity
Electrostatic analog to red shift, H. T. Drill—240(A)
Lorentz' triangles and fringe shift, W. B. Artmel—867(A)
Michelson-Morley-Miller experiment, W. B. Cartmel—315(A)
Transverse Doppler effect, C. J. Davisson—90(L)

Scattering of electrons, neutrons and ions (see also **Electrons, scattering of; Electron diffraction**)
Of alkali ions in gases, K. H. Bracewell—639
Of α-particles by A, O_2 and Ne, G. Brubaker—1011
Angular distribution of photoelectrons, H. Trueblood, D. H. Loughridge—239(A); 545
Of electrons from Ag crystal, J. C. Turnbull, H. E. Farnsworth—509
Of fast electrons and positrons in Pb, W. A. Fowler, J. Oppenheimer—320; W. A. Fowler—773(L)
In H and atomic electron velocities, A. L. Hughes, M. A. Starr—189
Magnetic scattering of neutrons, P. N. Powers—827
Neutrons by H_2, N_2 and H_2O, F. G. Brickwedde, J. R. Dunning, H. J. Hoge, J. H. Manley—266
Of neutrons by paramagnetic salts, M. D. Whitaker, H. G. Beyer, J. R. Dunning—771(L)
Of slow neutrons with gases, H. Carroll, J. R. Dunning—541(L)
Of Yukawa particles I, O. Laporte—904
Secondary electrons (see **Electrons, secondary**)
Solid state (see **Crystalline state**)
Specific heat
Of Rochelle salt between −30° and +30°C, A. J. C. Wilson, J. F. G. Hicks, J. G. Hooley—87(L); A. J. C. Wilson—1103
Spectra, absorption
Alterations in near infra-red spectra of water and protein molecules in gelatine, J. W. Ellis, J. Bath—236(A)
Of CD_4 in infra-red, A. H. Nielsen, H. H. Nielsen—118
Equivalent absorption coefficient, W. M. Elsasser—126
Of hydrocarbons, ultraviolet, E. P. Carr, H. Stücklen—865(A)
Of I Cl in ultraviolet, J. L. Binder—114
Of N_2, new Rydberg series, R. E. Worley, F. A. Jenkins—305(L)
Pressure shifts of high terms of Na, Rb, and Cs, Ny Tsi-Zé, Ch'en Shang-Yi—1045
S–H frequency of mercaptans, D. Williams—504
Vibrational-rotational transitions in H_2O in solvents, J. W. Ellis, E. L. Kinsey—599
Spectra, atomic
Of Co VI and Ni VII, L. W. Phillips, P. G. Kruger—839
Complex spectra, theory of, G. H. Shortley, B. Fried—739
Configurations in Cu II and rare gases, G. H. Shortley, B. Fried—749
Fine structure of Hα and Dα, S. Pasternack—1113(L)
Of Ir I, W. Albertson—183
Of Pb III, M. F. Crawford, A. B. McLay, A. M. Crooker—313(A)
Of Rb III and Sr IV, D. H. Tomboulian—350
Of Na III, D. H. Tomboulian—347
Of Sn II, W. W. McCormick, R. A. Sawyer—71
Spectra, general
Electrostatic analog to red shift, H. T. Drill—240(A)
New survey of the international Fe arc, D. W. Weeks, G. R. Harrison—312(A)
Nitrogen afterglow, J. Kaplan—176
Number of lines in a series, F. L. Mohler—313(A)
Resonance broadening, W. V. Houston—237(A); 884
Transitions between closely spaced levels, A. Landé—940
Wave-length of N_2 line, J. Kaplan—541(L)
Spectra, molecular (see also **Molecular structure and constants**)
Of BF, rotational structure of $^3\Sigma - {}^3\Pi$ bands, F. W. Paul, H. P. Knauss—1072
Of chlorides of Ni, Co, and Fe, K. R. More—122
Of CuCl excited by active nitrogen, S. Bloomenthal—497
Of H_2, bands ending on $2p^1$ II level, G. H. Dieke—439
Of H_2, emission bands, C. R. Jeppesen—68
Of HgCl, CdCl, and ZnCl, S. D. Cornell—341
Of PbH, W. W. Watson—1068
Spectroscopy, technique
Analysis of fertilizers, S. S. Ballard—312(A)
New survey of the international Fe arc, D. W. Weeks, G. R. Harrison—312(A)
Source, high pressure arc, W. W. Watson—865(A)
Statistical mechanics (see **Mechanics, statistical**)
Superconductivity (see **Electrical conductivity and resistance**)
Supersonics (see **Acoustics**)

Thermal conductivity
Of metals, pressure coefficient, C. Starr—210
Thermal expansion
Of crystalline Na between 80°K and 290°K, S. Siegel, S. L. Quimby—76
Thermionic emission of electrons; emitting surfaces
Studies of thoriated W, A. J. Ahearn, J. A. Becker—448
Thermodynamics
Minimum property of free energy, R. Peierls—918

Van der Waals forces
Quadrupole contributions, H. Margenau—867(A)
Vaporization (see **Evaporation**)
Vapor pressure
Of isotopes, K. F. Herzfeld, E. Teller—912
Viscosity
Effects of pressure and temperature on toluenes, H. E. Morgan, R. B. Dow—312(A)
Of helium, E. A. Uehling, E. J. Hellund—479(L)
Of liquid He II, W. F. Giauque, J. W. Stout, R. E. Barieau—147(L)
Of lubricating oils at various temperatures, R. B. Dow—312(A)
Of nonpolar liquids, S. Kyropoulos—241(A)

X-rays, absorption
Of wave-length $1.5 \leq \lambda \leq 8.3$A, C. L. Andrews—994
X-rays, diffraction, scattering, reflection, refraction and polarization
Anomalous dispersion in calcite, R. M. Whitmer, G. A. Lindsay—988
Beilby layer on quartz crystals, F. R. Hirsh, Jr.—238(A)
Diffraction under high pressures, R. B. Jacobs—325
Diffuse scattering from oscillating quartz, G. E. M. Jauncey, W. A. Bruce—163

Electric field on Laue pattern, A. Němejcová, J. Brož—379
Plural x-ray reflection, diffraction pattern of calcite, V. L. Bollman, H. H. Bailey, J. W. M. DuMond—792
Reflection from quartz in electric field, Y. Kakiuchi—772(L)
Scattering and absorption in N_2, H. C. Trueblood, D. H. Loughridge—239(A); 545
Shape of Compton line, H. A. Kirkpatrick, J. W. M. DuMond—802
Surface layers in calcite crystals, V. L. Bollman, J. W. M. DuMond—238(A)
Validity of x-ray methods of determining e, V. L. Bollman, J. W. M. DuMond—1005

X-rays, emission
Chemical combination and K-fluorescent lines, L. Obert, J. A. Bearden—1000
L series data, L. G. Parratt—99

Zeeman effect
In argon, J. B. Green, B. Fried—876
Of Cr lines, B. V. Thosar—233(L)
In Ne, J. B. Green, J. A. Peoples, Jr.—602